DFG Research Group 2104
Need-Based Justice and Distribution Procedures

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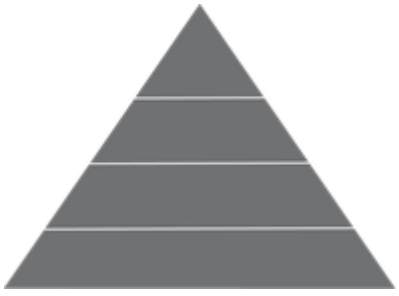
Working Paper Nr. 2016-03

http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2016-03.pdf

Date: 2016-12-12



DFG Research Group 2104 at Helmut Schmidt University Hamburg
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Entitlements and Loyalty in Groups: An Experimental Study

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Abstract

We study loyalty in groups that are exogenously assigned based on members' performances in a task. We observe that in-group bias is strong and significant among subjects who score high in performance, and that it is weak and insignificant among those who score low. This asymmetric pattern is mirrored in the punishment of disloyal subjects within groups. The results are consistent with an explanation according to which fairness judgments depend on entitlement considerations and provide a new perspective on theory and empirical research that argues that group identity increases with the status of the group.

JEL: C92, D31, D63

Keywords: entitlements, fairness, group loyalty, status, punishment, social norms, minimal groups

*We gratefully acknowledge support from the Vienna Center for Experimental Economics(VCEE), the Austrian Science Fund (FWF), under Project no. S 103070-G14 and the German Research Foundation (research group FOR 2104 "Need-based justice and distributive procedures" TR 458/6-1). We also thank Meike Benker, Lars Feld, Sarah Necker, Ulrich Schmidt, Stefan Traub, James Tremewan, the participants at the ESA International Conference in Jerusalem 2016, the ESA European Meeting in Bergen 2016, and the GfeW Conference in Giessen 2016 for helpful comments, discussions and encouragement.

1. Introduction

Entitlement motives play an important role in social perceptions regarding the fairness of relative positions in income and wealth. These motives depend on the extent to which individuals are perceived as accountable for differences in economic performance (see Konow (2000), Fong (2001), Croson and Konow (2009), Gill and Stone (2010), Krawczyk (2010), Cappelen et al. (2013), Gill and Stone (2015), Mollerstrom et al. (2015)).[1] At the same time, economic performance often is correlated within naturally occurring groups.[2] Such correlations imply that individuals are more similar within than across groups, thereby contributing to the salience and comparability of performance differences between groups. It is, therefore, important to understand how entitlement perceptions affect the behavior of individuals in groups.

Our study illustrates that entitlements provide an argument for asymmetric in-group bias between high- and low-performing groups. The argument rests on the assumption that individuals acknowledge earned entitlements, that is, they agree that high-performing individuals who put in more effort deserve greater claim to economic rewards. Moreover, we assume that performance is clustered in groups and that individuals believe that the per-

[1] In psychology and sociology, the concept of entitlements is discussed under the notion of "equity theory" and was first advocated by Adams (1965) and Homans (1974).

[2] Group outcomes are correlated, for instance, because of sectoral and regional labor market frictions, structural features of local housing markets, determinants of migration, and the fact that learning and the spread of information are bounded by groups. Moreover, structural variables typically interact with so-called endogenous social interaction effects. See, for example, Manski (2000), who generally distinguishes endogenous interactions from contextual and correlated effects.

formance of groups depends on more than luck. Together, these assumptions have the straightforward, but nonetheless surprising implication, that high-performing individuals, when grouped together, on average have a greater tendency to favor the in-group over the out-group.

In this study, we demonstrate the asymmetry effect of entitlements between groups in a laboratory experiment. Subjects in the role of the decision maker take a one-time decision with payoff consequences for two other subjects, who are passive. The decision maker can implement either an equal distribution of payoffs, or an unequal one that favors herself and a second subject at the cost of the third subject. To measure the extent of in-group bias, in two conditions, A and B, the design randomly varies in who shares the same group with the decision maker. In condition A, the materially self-interested choice inflicts a loss on the in-group member at the benefit of the out-group member. Condition B is identical except that the self-interested choice hurts the out-group member to the benefit of the in-group member. The advantage of this design is that it provides a measure of in-group bias as the difference in average behavior between conditions A and B, thereby accounting for individual-specific unobserved factors along with subjects' assignment to performance-based groups.

In the main treatments of the experiment, to create entitlements, we assign subjects to either high- or low-performing groups based on their scores in a cognitive ability test. Group assignment is common knowledge. As a control, we implement "minimal groups" based on a criterion unrelated to performance. Therefore, decision makers in the experiment can be members of any three "identity groups": high, low, or minimal. For each of these

groups, we measure the in-group bias as the average treatment effect between conditions A and B. The main result is that the in-group bias is strong in groups consisting of high-performing members, it is weak in low-performing groups, and it is about in the middle in minimal groups. Taken together, subjects are three times more likely to be in-group biased in high-performing groups than in low-performing groups (and two times more likely in high-performing than minimal groups).

We believe these findings point to a phenomenon that is important in many economic situations. In today's societies, groups often are occupation-specific. As such, they are congruent with organizational structures to exploit the benefits from specialization and agglomeration. Therefore, groups tend to differ by performance-related factors, such as required skills, economic returns from effort, and incentives for effort-based selection. We regard it as very likely that these factors matter for shaping entitlement perceptions and subsequent decisions.[3] Our insights imply, for example, that members of elites might be more in-group biased because they perceive each other as deserving.[4] In addition, entitlement perceptions might affect the permeability of group boundaries, as well as political views about, for instance, public education and progressive taxation of income.

The asymmetry effect of entitlements between groups suggests that subjects with a preference for desert disregard in-group favoritism as being unfair

[3]For theoretical arguments why beliefs might be endogenous to empirical levels of performance, see Piketty (1998) and Alesina and Angeletos (2005)

[4]An example of this is described by Anteby (2013), who notes that faculty members at Harvard Business School encourage insecure students as follows: "If you are here it's because you deserve to be here."

only in low-performing groups. To provide support for this argument, in an independent second decision stage of the experiment, we allow for costly punishment within groups. The interesting finding from this part of the experiment is that we observe instances of low-performing subjects punishing the in-group favoritism of low-performing peers. The same does not occur in high-performing or minimal groups in which subjects generally accept that decisions are in-group biased. Furthermore, punishment choices to a large extent are consistent with subjects' allocation choices. For example, subjects who forgo their own material benefits because they make choices for the benefit of their in-group peers in their allocation decisions are also more willing to punish others for being disloyal to the group. These findings further illustrate the social mechanism between entitlement perceptions and group cohesion in performance-based groups.

The rest of this paper proceeds as follows. In the next section, we discus our study from the perspective of the literature on group identity and status. In Section 3, we explain the experimental design. In Section 4, we report the results, and Section 5 concludes.

2. Further Literature

Despite being conceptually different, our study is related to the literature on group identity. Group identity is a sense of self derived from membership of group and the characteristics shared with its members (Tajfel and Turner, 1979; Akerlof and Kranton, 2000). Following our argument, the asymmetry effect arises mechanically from a meritocratic notion of entitlements in situations in which performance is clustered in groups. This interpretation

is based on entitlement theory and is not determined by a concept of self-evaluation. We observe that both high- and low-performing decision makers avoid disfavoring others who are high performing. In comparison to minimal groups, this pattern adds to the in-group bias in groups consisting of high-performing subjects; and it mitigates the in-group bias in groups consisting of low-performing subjects. This behavior can be consistently explained by a meritocratic notion of entitlements.

There are several strands in the literature that lend support to the interpretation of the observed asymmetry in terms of entitlements. Alongside the literature on social preferences showing that inequality is perceived as legitimate only if it is determined by factors under individual control (see the references in the first paragraph in the introduction and Frohlich and Oppenheimer (1992); Miller (1999); Konow (2003); Traub et al. (2005); Sen (2011); Gaertner and Schokkaert (2011); Fong (2001)), our study is related to the literature on social status. For example, Hoffman et al. (1994) show that if the right to be the first mover in a bargaining game was earned by scoring high on a general knowledge quiz, then subjects behaved in a more self-regarding manner. Likewise, the second movers were more willing to accept low offers when the first mover scored high in the quiz. Ball et al. (2001, p161) define a person's status as a "ranking in a hierarchy that is socially recognized and typically carries with it the expectations of entitlements to certain resources."[5] They find in an experiment that high-status subjects capture a greater share of surplus from market transactions. Similar to Hoff-

[5]See Heffetz and Frank (2008), for a thorough discussion of possible meanings of status in economics, including its function as a signaling device.

man et al. (1994), Ball et al. (2001) use subjects' performance in a trivia quiz as a proxy for status, which renders their results consistent with the entitlement argument.

Our study illustrates how these well-established patterns of behavior matter in the context of groups. Importantly, this shifts the focus away from whether subjects claim a high reward for themselves.[6] Rather, what matters in our context is the extent to which subjects regard other members of their in-group as deserving a high reward in comparison to an out-group. The recent literature on the role of entitlements in economics illustrates that the behavior observed in experiments such as ours is compatible with a generalization of distributional preferences accounting for how a particular distribution comes about (see Konow (2000), Gill and Stone (2015) for formal models of entitlement concerns).

Consensus to acknowledge earned entitlements also provides a plausible underpinning of the well-documented finding in social psychology that individuals' self-evaluation increases with the status of the group (see, among others, Tajfel (1982), Mullen et al. (1992), Bettencourt et al. (2001), Rudman et al. (2002), Shayo (2009), and Newheiser and Olson (2012)). According to social identity theory, self-evaluations are comparative and individuals derive a positive sense of self if the in-group is perceived as positively differentiated from the out-group. Members of low-status groups, by contrast, would ap-

[6]In our experiment, we do not observe that high-performing subjects would claim a higher reward for themselves independently of the condition (A or B). From this perspective, it does not seem that high-performing subjects act in a self-serving manner. Note however, that the decisions in our experiment are nonstrategic and differ with regard to several other dimensions, for example, those in Hoffman et al. (1994).

ply one or more "disidentification" strategies in order to protect a positive self-image. Such strategies would include leaving the group, trying to positively differentiate the own group by dimensions unrelated to status, or to accept the inferiority of the own group so as to avoid cognitive dissonance. However, as pointed out by Tajfel and Turner (1979), it is not obvious how this argument could explain an asymmetry effect of status. To observe this, note that if group status were perceived only as a means to obtain access to scarce resources, groups would have an incentive to compete. Inter-group competition, on the other hand, is a strong argument in favor of the development of in-group cohesion irrespective of the status of a group (Sherif et al., 1961).

The interpretation based on the results of our study is that the asymmetry effect of status arises because status signals deservingness. From this perspective, it is implausible that the members of low-status groups would perceive themselves as inferior irrespective of how the differences in status come about. Support is derived from evidence suggesting that a sense of "consensual inferiority" amply observed among low-status groups breaks down if status differences are perceived as illegitimate in the sense that they arise from factors beyond individual control (see, for example, Ellemers et al. (1999), Bettencourt et al. (2001), and Levin et al. (2002); for a more general overview of the research on legitimacy in psychology, see Tyler (2006)). We note, however, that the conventional empirical concepts of status encompass the entitlement dimension. Consequently, the bulk of the existing research is noninformative for inferring the nature of the asymmetry effect of status.[7]

[7]See Cheng et al. (2014) for a review of experimental and survey measures to manipulate

On a more general note, our study is related to the literature on group identity and social preferences (see Chen and Li (2009), Klor and Shayo (2010), and Lindqvist and Östling (2013)). To our knowledge, our study is the first to illustrate the implications of entitlement considerations for in- and out-group behavior within that field. In addition, our study is related to emerging literature on in-group bias in "real" social groups as opposed to artificially assembled "minimal" groups (see Hewstone et al. (2002), Bernhard et al. (2006), Fowler and Kam (2007), Goette et al. (2012), Cappelen et al. (2013), Schniter and Shields (2014), and Chowdhury et al. (2016)). The results of this literature suggest that there are quantitative important moderators of in-group bias. Our study complements this literature by hinting at perceptions of earned entitlements as an important source of heterogeneity of in-group bias between naturally occurring real groups.

3. Experiment

The experiment has four stages: a performance stage, a group-assignment stage, and two decision stages (see figure 1). The subjects receive instructions separately for each stage (compare the instructions in the Appendix). At any particular stage, the subjects are not yet informed about what will happen in the subsequent stage(s).

The performance stage. In this stage, we ask the subjects to answer a series of questions, which have the format of nonverbal multiple choice questions commonly used in tests of cognitive ability.[8] Subjects receive no

status in social psychology research.

[8]The test uses 15 questions taken from a test of progressive matrices. Each question

payment for performance. Therefore, next to cognitive ability the test scores are likely to reflect characteristics associated with effort (Segal, 2012). At the end of this stage, all subjects receive private feedback on their scores.

Depending on the group assignment (described in detail below in this section), some subjects additionally learn whether their own score falls in either the upper (high) or lower (low) half of the distribution of scores in the same session.

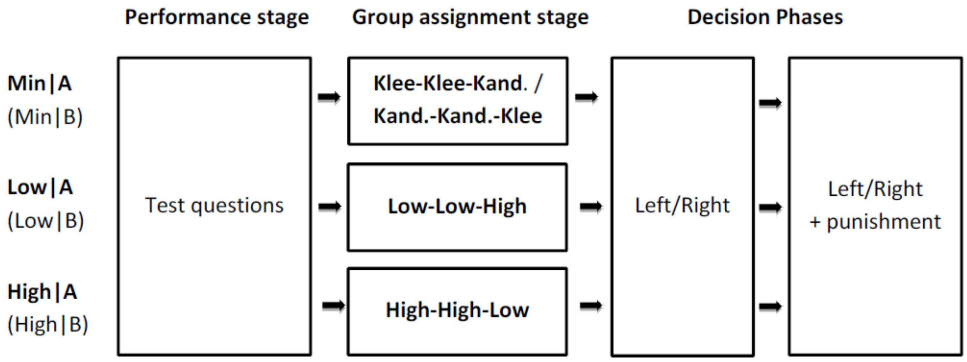


Figure 1: Overview and timeline of the experimental design

The group-assignment stage. We use two methods of assigning subjects to social groups. To induce entitlements, we have treatments in which we assign subjects to "performance-based groups" based on their scores from the performance stage. In particular, we split them by session medians into two groups: the group that scores "High" and the group that scores "Low"

offers six possible answers, only one of which is correct. Subjects are given 1 minute per question. An example is provided in the instructions. See the Appendix: Figure C.1.

in every session. Subjects in these treatments are labeled as being of type "Low" or "High."

As a control, we run treatments in which we assign subjects to "minimal groups." We follow the method proposed by Chen and Li (2009). Accordingly, subjects view five pairs of paintings. In each pair, one painting is by Wassily Kandinsky and the other by Paul Klee. Subjects indicate which painting they prefer in a given pair and subsequently, are split by the median preference of subjects in the same session. This method divides the subjects into two groups, the "Klee" group and the "Kandinsky" group.

Treatments and the first decision stage. After all subjects have been assigned to either the performance-based or the minimal groups, we further match them into subgroups of three. The matching is such that in all subgroups, subjects take one of three roles: (i) an active in-group member who is the only subject that takes a decision (I_A), (ii) a passive in-group member who does not take a decision (I_P), and (iii) a passive out-group member (O). The group assignment and the manner of matching subjects into subgroups generates four decision treatments.

Figure 2 illustrates the treatments. Consider first the minimal-groups' treatments in the upper part of the figure. In the treatments labeled Klee|A and Klee|B, there are Klee–Klee–Kandinsky groups in which the decision makers are of type Klee; likewise, in Kand.|A and Kand.|B, there are Kandinsky–Kandinsky–Klee groups in which the decision makers are of type Kandinsky (the details on conditions A and B are explained later in this section). Due to the minimal group paradigm, decisions should not differ between Klee|A and Kand.|A or between Klee|B and Kand.|B. Hence, we regard the decisions

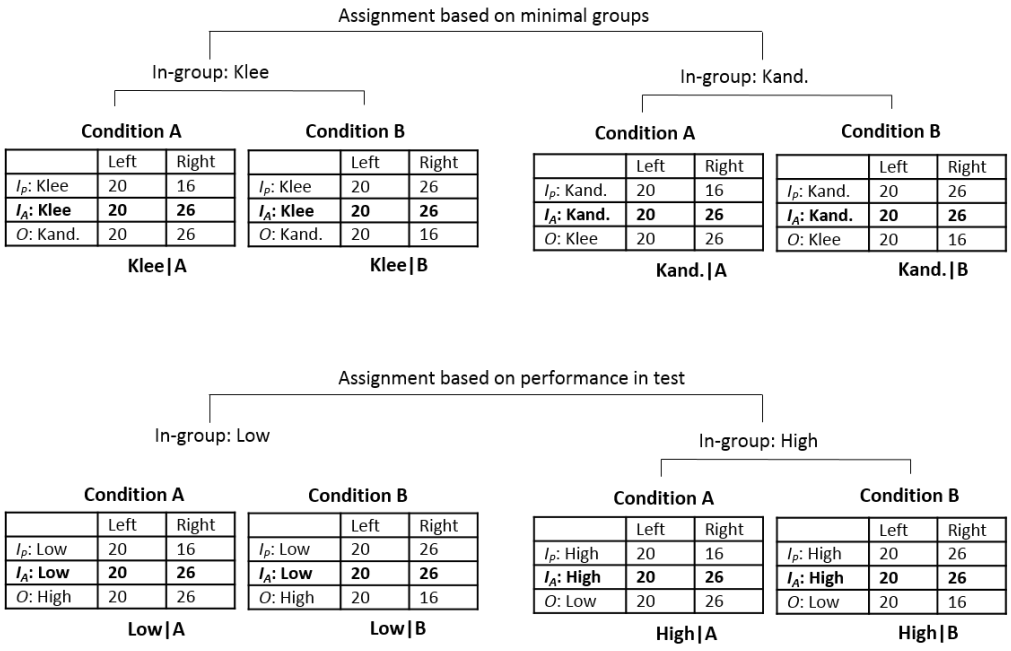


Figure 2: Overview of treatments, roles, and distributions.

from these groups as taken from the same treatments, labeled as Min|A and Min|B.[9]

Next, consider the performance-based groups in the lower part of the figure 2. In these treatments, 1/3 of all High-scoring and 1/6 of all Low-scoring subjects of a session are randomly assigned to High–High–Low groups with a High-scoring subject in the role of the decision maker. The remaining subjects (1/6 of all High-scoring and 1/3 of all Low-scoring subjects) are matched to Low–Low–High groups with a Low-scoring decision maker. In this way, we generate one treatment in which the decision makers score high

[9]Our results show there is indeed no difference between the Klee and Kandinsky types of decision makers. See section 4.

in High–High–Low groups (see High|A and High|B in the lower panels of Figure 2), and another treatment in which they score low in Low-Low-High groups (Low|A and Low|B).

The decision. There is just one decision maker (I_A) in every group. The task of the decision maker is to choose between two earnings distributions, LEFT and RIGHT (compare Figure 2). The LEFT choice implies that all group members receive the same payoff. In condition A, if the active in-group decision maker (I_A) chooses RIGHT, the incomes of I_A and the out-group member (O) increase, and the income of the passive in-group member (I_P) decrease. Therefore, choosing LEFT is costly to the decision maker and has a negative effect on the out-group member. On the other hand, choosing LEFT implements an outcome-fair distribution and favors the in-group member. Figure 2 illustrates this choice for the parameters we use for the experiment (see panels labeled "Condition A"): if I_A chooses LEFT, all three group members earn 20 points; if this subject chooses RIGHT, I_A and O earn 26 points, whereas I_P earns 16 points.[10] The decision maker makes only one choice. After that, the first decision stage is over.

A measure of in-group bias — "Condition A" versus "Condition B". In "Condition A," next to being biased toward the member of the in-group, subjects might choose LEFT because they prefer an outcome-fair distribution irrespective of any in- and out-group considerations. Moreover, in

[10] As an example, consider the choice of an employer between two job candidates who differ with respect to two dimensions: productivity and identity. For employers at the margin of indifference, choosing the in-group candidate would be costly in terms of productivity differences and would actively discriminate against the out-group candidate. Lower productivity is considered by making the distribution LEFT less efficient with respect to the sum of payoffs (following the Kaldor–Hicks criterion).

performance-based groups, decision makers in High|A and Low|A might differ regarding social preferences and other unobserved traits because of selection. To net out these effects, we implement treatments labeled as "Condition B," which swap the payoffs between I_P and O (see the respective panels in Figure 2). For example, between High|A and High|B, subjects in the role of I_A face identical decisions in terms of their own payoffs and the overall distribution of payoffs among themselves and others. Therefore, if their decisions were irrespective of the in- and out-group dimension, we would observe no systematic difference between these two conditions. By contrast, if decisions were biased in favor of the in-group member, we would observe more Left choices in High|A than in High|B. The same argument applies for the differences between Low|A versus Low|B, and Min|A versus Min|B. Therefore, the difference-in-difference effects provide a measure of in-group bias for different identity groups.[11]

Symmetric versus asymmetric in-group bias. The main interest of our design is to test whether the magnitude of the in-group bias depends on how subjects are assigned to groups. In the treatments with minimal groups, group assignment is orthogonal to performance. Therefore, entitlement motives should not play a role and we would predict that the in-group bias is symmetric between Klee and Kandinsky types. Because of entitlements, this symmetry should break down between performance-based groups. In Low|A,

[11] A different approach to account for selection is used by Ball et al. (2001). In their design, subjects performed a quiz and were sorted into high-status ("Star") or low-status ("No Star") groups. These groups were actually formed independently of performance, but the instructions were written in a way that made subjects believe that the members of the Star group were deserving.

subjects in the role of I_A know that they are of type "Low." Hence, they might consider others, who are of type High," as more deserving. In this case, entitlement considerations would mitigate the difference between Low|A and Low|B. The opposite effect should be obtained for decision makers of type "high" between conditions High|A and High|B.

Decision mode. Subjects are randomly assigned to their roles given the constraints of the group assignment stage. The roles are fixed for the entire experiment. However, to increase the number of observations per group, at the time of taking the decision, the two in-group members I_A and I_P do not yet know which role they are in. These subjects take the decision conditional on being in the role of I_A, and they learn their actual role only at the end of the experiment.[12]

In-group punishment and the second decision stage. If subjects were concerned about a norm of loyalty within the group, they would be willing to sacrifice money for enforcing it (see Harris et al. (2015) for evidence of group favoritism as a social norm). Moreover, our interest is to observe whether the strength of a social norm, as measured by norm enforcement, differs across treatments. To allow for this option, we introduce a second decision stage. This stage is identical to the first one, with the exception that subjects in the role of I_P can now assign up to 4 deduction points to subjects in the role of I_A. For subjects in the role of I_P, sending 1 deduction point costs 1 point in own earnings. For those in the role of I_A, each punishment point received

[12]Note that while asking subjects to put themselves in each other's roles might in itself generate a feeling of group attachment, we apply the same procedure in all treatments. Therefore, such effects would difference out across treatments. See also Brandts and Charness (2011) for a discussion of using the "strategy method" in experimental economics.

reduces the earnings by 3 points.

In the second decision stage of the experiment, the two in-group members first enter their decision conditional on being in the role of I_A and then, before they learn their true roles, they choose their deduction points conditional on being in the role of I_P and on whether I_A has chosen LEFT or RIGHT. At the time of deciding between LEFT and RIGHT, subjects know that their choice might be punished by their in-group peer.[13] After all subjects have completed their choices, they learn their roles and the respective decisions are implemented.

We hand out the instructions for the second decision stage only at the end of the first decision stage. At this point, the subjects have no information yet about the decisions and outcomes of the first decision stage. It is still possible that decisions change following some systematic pattern over repeated decisions. However, we are interested in the norm-enforcement behavior of subjects in the role of I_P conditionally on the behavior of subjects in the role of I_A. Order effects between phases are of no relevance to that question.

Payment: At the end of the experiment, we calculate subjects' earnings from both decision stages and pay them at the exchange rate of 1 point = €0.35.

[13] In addition, we ask the out-group members O to state their expectations about how many subjects in the role of I_P would punish I_A. We ask: *"Out of 10 subjects in the role of I_P, how many do you think will send 'deduction points' to I_A for choosing LEFT?"* and *"Out of 10 subjects in the role of I_P, how many do you think will send 'deduction points' I_A for choosing RIGHT?"* Subjects are paid additional 5 points if they guess either one of these answers correctly.

4. Results

We ran the experiment at the Vienna Center for Experimental Economics in October 2013. In total, 246 subjects participated in 12 sessions. There were between 18 and 24 subjects in each session. A session lasted for approximately 1 hour, and the average subject earned €15.1. Subjects were recruited via ORSEE (Greiner, 2015), and the experiment was programmed and conducted with z-Tree (Fischbacher, 2007). Table 1 shows the number of groups and observations per treatment. Because the design elicits the decisions of both in-group members I_A and I_P in the strategy mode, there are two observations per group.

We first focus on whether subjects who score high in performance differ in terms of group-loyalty from subjects who score low. After that, the analysis compares the behavior between real and minimal groups for both high- and low-performing subjects. Finally, we analyze the punishment behavior in the second decision phase of the experiment.

4.1. Ingroup-bias and performance

Figure 3 shows the relative frequency of LEFT choices for the real-group treatments in the first decision phase. First, consider the behavior of low-scoring subjects in the two leftmost bars: 57.14% (16/28) of low-scoring subjects in the role of I_A chose LEFT in treatment Low|A. While this number indicates a great deal of solidarity with the losing subject of the group, only a small part of the result can be attributed to group loyalty. In Low|B, 42.31% (11/26) of low-scoring subjects chose LEFT. Accordingly, the in-group bias

Table 1: Treatments and numbers of observations

Treatment	subjects	no. of groups (no. of observations in brackets)
Low|A	42	14 (28)
Low|B	39	13 (26)
High|A	42	14 (28)
High|B	39	13 (26)
Min|A	48	16 (32)
Min|B	36	12 (24)
Total	246	82 (164)

Notes. The number of observations is twice the number of groups because two subjects of the same type in every group take a decisions conditional on being in the role of I_A.

amounts to 14.83 percentage points. This number is not significantly different from zero (57.14% vs. 42.31%, $p = 0.276$ χ^2 test, two sided).

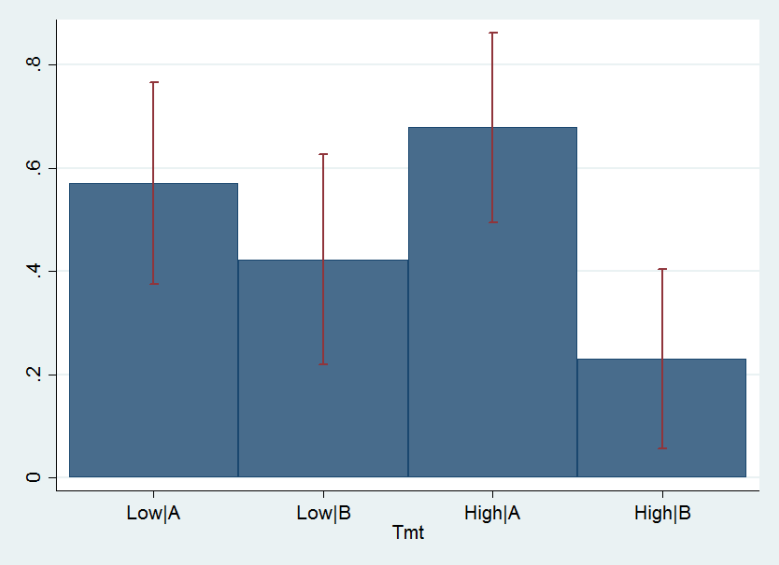


Figure 3: Asymmetry of in-group bias between HIGH and LOW (relative frequency of LEFT choices in the first decision phase by treatment; error bars show 95% confidence intervals).

The result is different for high-scoring subjects. In this case, 67.86% (19/28) of subjects chose LEFT in treatment High|A, and only 23.08% (6/26) did so in High|B (see the two rightmost bars in figure 3). Therefore, the in-group bias amounts to 44.78 percentage points, which clearly differs from zero ($p = 0.001$). The in-group bias is larger for high-scoring than for low-scoring subjects, although the difference-in-difference effect of 30 percentage points ($44.8 - 14.8$) is only borderline significant ($p = 0.103$, two-sided).

We conclude that the in-group bias is strong and significant only for subjects who score high in performance. In general, subjects' cognitive skills and, therefore, their assignment to groups might not be independent of social preferences (e.g., Ben-Ner et al. (2004)) or other individual traits (e.g., Benjamin et al. (2013)). Remember, however, that by differencing between conditions A and B, the design already accounts for this possibility. Moreover, pooling the data across conditions A and B, the frequency of LEFT choices does not differ between high- and low-performing groups (0.46 (High) vs. 0.5 (Low), $p = 0.703$); that is, the groups show the same general extent of outcome-fair behavior.

4.2. In-group bias and performance differences in minimal groups

In the treatments involving minimal groups, 43.75% of 32 subjects in the role of I_A chose LEFT in treatment Min|A, compared to 20.83% of 24 subjects in Min|B. Accordingly, the in-group bias is 22.9 percentage points for minimal groups. This number is significantly different from zero at the 10% level ($p = 0.073$), and lies just between the 14.8 and 44.8 percentage points observed for real-group treatments. Therefore, we replicate earlier findings in the literature, according to which minimal groups already generate in-group

bias. Furthermore, there is no asymmetry effect with assignment based on minimal groups.[14]

Figure 4 compares the behavior of high-scoring subjects (left panel) and low-scoring subjects (right panel) between the minimal-group treatments and the respective real-group treatments.[15] The results show that the in-group bias of high-scoring subjects is smaller when the group assignment is "minimal" compared to "performance-based." The in-group bias is only 6.8 percentage points for high-scoring subjects in Min|A and Min|B (25.00% vs. 18.18%, $p = 0.692$). By contrast, we have already observed that the in-group bias is 44.8 percentage points for high-scoring subjects in performance-based groups. For low-scoring subjects in minimal groups the in-group bias is 31.9 percentage points (55.00% in Low/Min|A vs. 23.08% in Low/Min|B, $p = 0.070$), which is larger than the bias of 14.8 percentage points in the LOW groups. These results show that the asymmetry effect is driven by what subjects know about the performance of the in-group relative to the out-group.[16]

[14]The in-group bias is 20.8% (37.5%-16.7%) in Kandinsky and 25% (50%-25%) in Klee subgroups; $p = 0.266$ χ^2 test, two sided.

[15]In the minimal group treatments, high-scoring subjects are those who perform above the median of all subjects in our experiment. Accordingly, there are 23 high-scoring and 33 low-scoring subjects in our minimal group treatments. Because of randomization, the distribution of types is orthogonal to treatment assignment; $p = 0.530$ χ^2 test, two sided.

[16]In all conditions, the decision makers are informed about their own absolute test scores; in addition, in performance-based groups, they learn something about their own scores relative to other subjects. It might be argued that this difference matters because decision makers are more likely to feel like strong (or weak) subjects. However, if we pool the data across conditions A and B, high-scoring decision makers are not more egoistic in minimal groups than in performance based groups, $p = 0.420$ (regression-based t-test using variable is LEFT as the dependent variable; independent variables are treatment (HIGH in comparison to MIN as the left-out category) and a control for the condition (A vs. B); the reported p-value refers to the estimated coefficient of the treatment dummy).

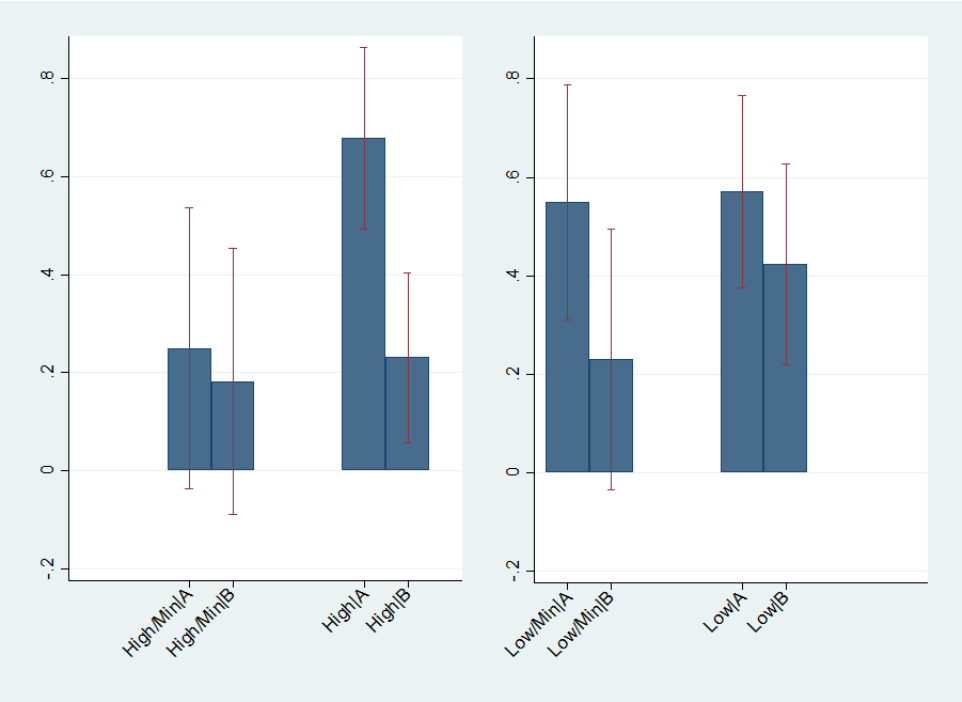


Figure 4: Frequency of LEFT choices split by treatment and performance (error bars show 95% confidence intervals).

Table 2 shows the results of a probit model with marginal effects summarizing our results. The dependent variable takes a value of 1 if a subject chose LEFT, and zero otherwise. Column (1) contains the results for decision makers who score high. Min|B is excluded from the regressions. Accordingly, the probability of choosing LEFT in the group of Highs (column 1) in Min|A is 9.1 percentage points higher than in Min|B but is not statistically different. In comparison, column (2) repeats the estimation for subjects who score

Similarly, the pooled outcomes do not differ between minimal and low-performing groups ($p = 0.297$). Therefore, the data do not support that this argument is important in our design.

Table 2: Probit model with marginal effects: Dep.Var is LEFT

	(1) High	(2) Low
Min|A	0.091	0.330*
	(0.232)	(0.169)
High|B	0.065	
	(0.191)	
High|A	0.447***	
	(0.124)	
Low|B		0.212
		(0.172)
Low|A		0.148
		(0.135)
Observations	77	87
Pseudo R-squared	0.153	0.042
Min|A(1) = Min|A(2)	$p = 0.098$	
High|A(1) = Low|A(2)	$p = 0.100$	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

low in the test. Here, the estimated in-group bias is 33.0 percentage points in minimal groups (see Min|A). These results show that individual performance does not asymmetrically determine the group bias already in minimal groups. It is the other way around: the in-group bias is more pronounced for low-scoring than for high-scoring subjects in minimal groups (see "*Min|A(1) = Min|A(2)*").

The middle and lower parts of Table 2 replicate the findings of figure 3. The in-group bias is measured as the difference between the probability of

choosing LEFT in the conditions A and B. Comparing High|B and High|A shows that the in-group bias is strong (44.7 percentage points) and significant for decision makers scoring high. For subjects who score low in the test, the in-group bias is 14.8 percentage points in real groups (Low|A). The row labeled "*High|A(1) = Low|A(2)*" indicates that the in-group bias for decision makers scoring high is significantly stronger than for decision makers scoring low.

4.3. In-group punishment

The second decision phase is a one-to-one repetition of the first one with the exception that subjects in the role of passive in-group member I_P in this phase can assign punishment points to the decision maker I_A. Subjects can assign up to 4 deduction points, each at a cost of 1 point for themselves, conditional on the decision maker choosing either RIGHT or LEFT. Aggregated over all conditions, 23.2% of subjects punish the decision maker for choosing RIGHT; 7.3% punish I_A for choosing LEFT. However, these numbers differ substantially between treatments. For ease of exposition, we transform the data into a variable $P_{R-L} = \{1, 0, -1\}$ if I_P punishes RIGHT {*more than, equally to, less than*} LEFT.[17] Figure 5 plots punishment behavior based on this variable. As in Section 4.2, in MIN, we split subjects by performance to account for possible selection effects.[18]

The Figure 5 shows that punishment is asymmetric in three dimensions.

[17]Remember that subjects in the role of I_P enter two punishment decisions, only one of which becomes relevant conditional on whether I_A has chosen LEFT or RIGHT.

[18]Variable P_{R-L} considers punishment behavior only on the extensive margin. Figure A.1 in the Appendix shows the distribution of punishment at the intensive margin. The analyses of this data give qualitatively similar results to those reported in the text.

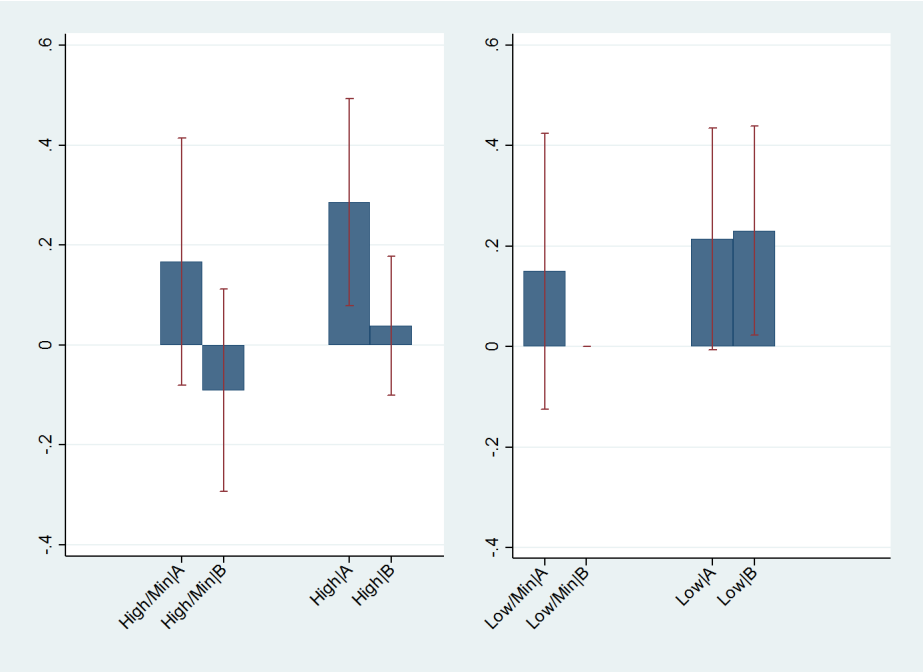


Figure 5: Means of variable P_{R-L}: $P_{R-L} = \{-1, 0, 1\}$ if subject punishes RIGHT {more than, same as, less than} LEFT, split by treatment and performance (error bars show 95% confidence intervals).

First, if we ignore the subtleties of some treatments for a moment, we observe that punishment is overwhelmingly directed toward decisions that implement the outcome-unfair (RIGHT) distribution: averaged over all treatments, $P_{R-L} = 0.15$, which is significantly different from 0 ($p = 0.000$). This pattern mirrors the behavior in phase one. There, we observe that on average over all treatments, more than 40% of subjects favor the outcome-fair (LEFT) distribution. Choosing LEFT is costly to subjects and, therefore, an expression of living up to a social norm. Thus, it might be expected that subjects who choose LEFT themselves are more likely to punish others for choosing RIGHT, that is, they are more willing to enforce the norm.

In line with this interpretation, the extent and direction of punishment differs strongly between subjects depending on their choices in the role of I_A: $P_{R-L} = 0.33$ for subjects who chose LEFT versus $P_{R-L} = 0.01$ for those who chose RIGHT in phase 1 ($p = 0.000$).

Second, in MIN and HIGH, there is substantially more punishment in condition A than in B ($p = 0.072$ and $p = 0.044$ for MIN and HIGH, respectively). The behavior in these treatments is in line with, for example, the assumptions of Fehr and Schmidt (1999), according to which subjects dislike inequality, but they dislike unfavorable inequality (in condition A) more than favorable (in condition B).[19] If subjects anticipate the observed asymmetry of punishment between conditions A than B, this would contribute to further enforcing a norm of in-group loyalty. Our results indicate that such a mechanism might evolve in treatments MIN and HIGH.[20]

Third, subjects in LOW stand out in that they punish their in-group peers for choosing the materially self-interested option (RIGHT) in both conditions A and B: variable P_{R-L} differs from zero in LOW|B ($p = 0.031$) and it differs between LOW|B and MIN|B ($p = 0.019$).[21] Consequently, the

[19]Negative reciprocity would be another reason for punishing the decision maker for choosing RIGHT in condition A (I_P receives a payoff of 16 points rather than 20 points). However, it would then be expected that subjects also punish the decision maker for choosing LEFT in condition B (I_P receives a payoff of 20 points rather than 26 points); therefore, additional assumptions, like loss aversion, would be needed to rationalize the asymmetric pattern of punishment between conditions A and B.

[20]We do not report the choice behavior of phase 2 because it is essentially the same as in phase 1. The result that choices do not change with punishment might of course change in a design that permits a repeated number of phases with feedback on punishment after each phase. However, our findings seem to be in line with a recent study by Weng and Carlsson (2015), who find no effect of punishment on cooperation in teams with strong identity.

[21]Between LOW|B and HIGH|B, the difference is significant only based on a one-sided

punishment pattern does not differ between LOW|A and LOW|B ($p = 0.912$). The punishment of RIGHT in condition A signals a norm against unfavorable treatment of out-group members. One way to interpret this pattern is that once they know that they perform low, people favor a norm of equality (in low-performing groups, subjects are punished for not choosing the equal distribution both in Low|A and Low|B); otherwise, they favor a norm of entitlement (in high-performing groups, subjects are punished for not choosing the equal distribution in High|A but not in High|B). This interpretation fits with the results of Barr et al. (2015), who show that an individual's tendency to acknowledge earned entitlement is associated with his or her economic status relative to others. Note that this behavior is difficult to reconcile with simple inequality aversion. This is indicated, for instance, by the low level of punishment in the control LowMin|B.[22]

5. Discussion and conclusion

We illustrated in an experiment that groups consisting of subjects who perform high in a task requiring cognitive effort are more in-group loyal than those who score low. Our measure of group bias controls for potential self-selection to explain this result. We propose a meritocratic notion of

test ($p = 0.060$).

[22] In the experiment, we ask the subjects in the role of O to state their expectations about how many subjects in the role of I_P would punish I_A (see section 1). Table B.1 in the Appendix shows these data in the same format as Figure 5. Aside from the fact that subjects overestimate the actual extent of punishment, the expectations very well reflect the actual punishment. Accordingly, subjects expect that the decision maker is regularly punished for a choice that harms the passive in-group member in treatments Min|A, Low|A, and High|A. As with actual behavior, however, subjects do not expect a difference in punishment between Low|A and Low|B.

entitlements as a consistent explanation for the observed asymmetry effect. Accordingly, decision makers care that subjects obtain what they deserve.

Efforts to empirically identify the asymmetry effect of entitlements outside the laboratory would of course be plagued by the fact that members of high- and low-performing groups likely differ on numerous unobserved domains. Selection effects could emerge, for example, when factors that are relevant for performance (e.g., cognitive skills) are associated with subjects' preferences or traits (e.g., a taste for equality or maximin concerns). Our experiment accounts for this argument because it elicits decisions both from high- and low-performing subjects in two conditions, *A* and *B*. Averaged across conditions, our results show that the decisions of high- and low-performing subjects are the same; that is, high-performing subjects are not more or less other-regarding than low-performing ones. Moreover, if we consider the decisions in our controls with minimal groups and absent explicit information about group members' performance, high-performing subjects are not more in-group biased than low-performing subjects. These findings illustrate that high- and low-performing subjects are not different with regard to social concerns or the mere perception of belonging to two distinct groups.

A related concern is that subjects might hold beliefs that are associated with performance. Therefore, providing subjects with information on mutual performance might affect their beliefs. Consider beliefs about income and gender as two plausible examples: subjects could believe that individuals who score high in a test of cognitive ability have higher levels of income and wealth; similarly, they could hold stereotypical beliefs according

to which men dominate in high-performing groups.[23] Given such beliefs, subjects motivated by outcome-based social preferences supposedly would want to distribute payoffs from high- to low-performing subjects because they regard the latter as less wealthy and more in need. Moreover, existing evidence on gender differences in bargaining and distribution games indicate that men generally tend to receive less (and give less) than do women (see, e.g., Dufwenberg and Muren (2006)). Both arguments run contrary to our findings, which suggests that the beliefs argument would even bias downward our results.

We regard our findings as important, as most natural groups differ regarding income, wealth, and educational achievements. These variables are correlated with the ability and willingness to exert effort, for example, in high-quality jobs. The reasons that groups are economically segregated are, of course, manifold. One of those reasons, which we did not consider in our design, is homophily (see Currarini et al. (2009)), which means that people tend to form groups others who are similar. The question is then whether the factors that lead to the formation of natural groups would mitigate or enhance in-group bias generated by entitlement perceptions. Based on the results of our experiment, it could be surmised that groups are equally biased as long as the group assignment is perceived to be caused by factors beyond individual control. On the other hand, a belief that the characteristics of the groups are determined by the effort of its members would suffice to generate

[23]Such beliefs indeed seem warranted according to empirical studies: see Heckman et al. (2006) on the relationship between cognitive ability and labor market outcomes, and Croson and Gneezy (2009) for a survey and discussion of gender differences in relation to confidence.

the effects we describe in the experiment.

Evidence from surveys illustrates that differences in performance due to work preferences and abilities are indeed highly salient in people's perceptions (see Alesina et al. (2011)). For example, Fiske et al. (2002) observe that Americans generally associate high group status with favorable traits, such as being competent or deserving, and low group status with laziness or not being intelligent. Furthermore, psychological research provides evidence that these perceptions tend to be biased. On the one hand, successful people often downplay the role of luck as a reason for success — a phenomenon known as "illusion of control" (Langer, 1975). On the other hand, members of socially disfavored groups often perceive themselves as less than deserving — a phenomenon sometimes referred to as "system justification" (see Major (1994) and Jost (2001)). Such phenomena would further enforce the phenomenon we observed in our experiment.

In summary, the asymmetry effect of entitlements between groups contributes to understand why members of low-status groups are less loyal to other members of their group. In terms of welfare, there are situations in which this kind of behavior could have large negative effects. For example, Gill and Stone (2015) show that entitlement considerations can mitigate the negative incentive effects within teams. Consequently, a lack of group loyalty might negatively affect cooperation incentives in low-performing groups.[24].

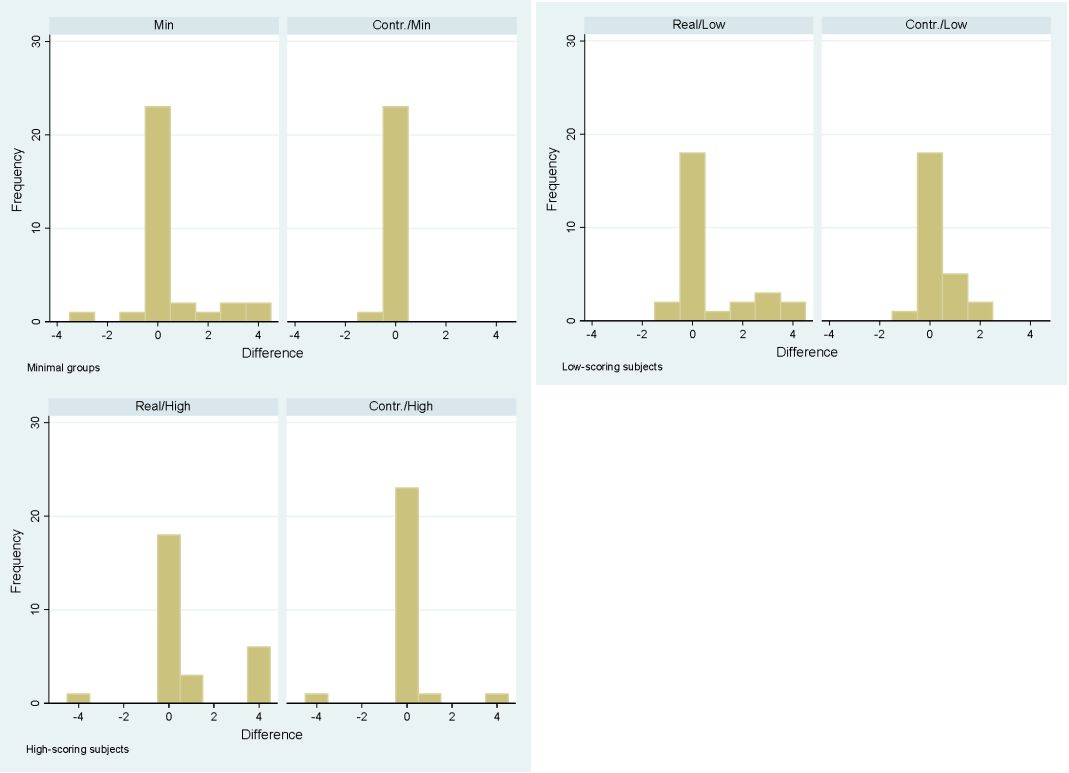
On the other hand, group loyalty is not always desirable. To illustrate

[24]Similarly, research in social psychology argues that the lack of group identity might have a negative effect on work motivation and performance. See van Knippenberg and Ellemers (2003)

this, consider the parameters we implemented in our experiment. In the treatments involving tension between group loyalty and self-interest, behavior that favors the in-group member decreases the overall sum of payments. This effect holds because, alongside avoiding negative consequences for the in-group member, the group-loyal choice inflicts harm on the out-group member. In-group loyalty, therefore, might be important in perpetuating social inequality, for example, when it gives rise to group conflict or when it hinders skills being used optimally owing to out-group discrimination (see Chowdhury et al. (2016) and Bandiera et al. (2009). Another example in which group loyalty leads to bad outcomes is given by Hadnes et al. (2013). In a study of entrepreneurial activity in Africa, these authors show that group-sharing norms lead to substantial inefficiencies because they reduce individual incentives to provide effort.

Appendix A. Figures

Figure A.1: Distribution of punishment per treatment



Note: Deduction points assigned by subjects in the role I_P to subjects in the role of I_A for choosing RIGHT minus those assigned for choosing LEFT. For example, among high-scoring subjects in real groups (High|A) in the bottom left panel, the entry at -4 indicates that one subject assigned 4 deduction points to I_A for choosing LEFT and 0 points for choosing RIGHT; in the same treatment, the entry at +4 shows that 6 subjects assigned 0 deduction points to I_A for choosing LEFT and 4 points for choosing RIGHT. The other entries read accordingly.

Appendix B. Tables

Table B.1: Expectations of subjects in role O regarding I_P's punishment: $P^e_{R-L} = \{1, 0, -1\}$ if O expects that I_P punishes I_A {*more than, equally to, less than*} for choosing RIGHT than LEFT.

Min|A ($N = 12$)	Min|B ($N = 16$)	
$P^e_{R-L} = 0.417$	$P^e_{R-L} = 0.875$	$p = 0.035$
Low|A ($N = 13$)	Low|B ($N = 14$)	
$P^e_{R-L} = 0.385$	$P^e_{R-L} = 0.500$	$p = 0.778$
High|A ($N = 13$)	High|B ($N = 14$)	
$P^e_{R-L} = 0.308$	$P^e_{R-L} = 0.786$	$p = 0.080$

Notes: p-values in parenthesis are based on two-sample Wilcoxon rank-sum (Mann–Whitney) tests.

Appendix C. Instructions

Instructions - part one

Welcome to the experiment. If you read the instructions carefully and follow the rules, you will have the opportunity to earn money. You will receive your payment in cash at the end of the experiment.In the experiment, we do not talk of Euros. Instead, all your payments are calculated in experimental points. The value of points is given by the following exchange rate:

1 point = 0,35 Euro.

During the experiment you are not allowed to speak to other participants. If you have any questions, please ask us, and we will answer your question in private. It is very important that you follow these rules. Otherwise, the results of this experiment have no value from a scientific perspective.

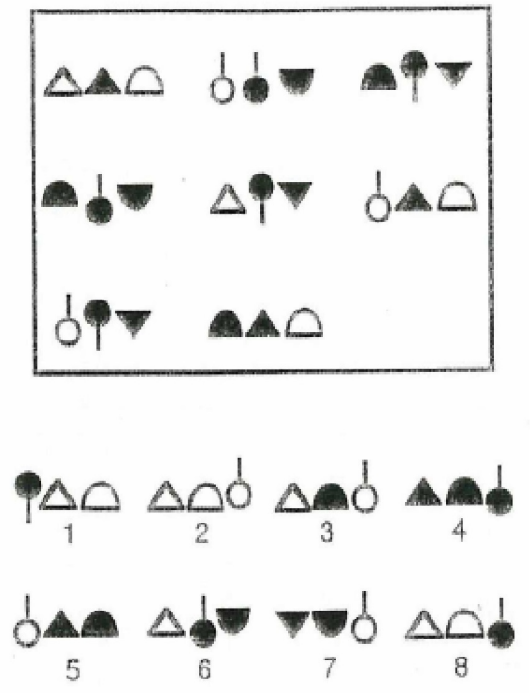
The experiment consists of **three parts**; every part is explained separately. The experiment will last approximately 60 minutes. We now explain the first part of the experiment.

Detailed information on the first part of the experiment

The first part of the experiment consists of one task *[two tasks in the MIN treatments]*, which are described as follows.

Task 1: You will observe 15 screens. On every screen you face a task. We ask you to solve as many tasks correctly as possible. There will be a time limit of 60 seconds per screen, otherwise the task counts as unsolved. At the end, you will be informed about how many tasks you have solved correctly. You will not receive any money for solving the tasks; nonetheless, we ask you to take this part seriously and try to solve as many tasks correctly as possible.

Figure C.1: Sample Screen IQ-test



Note: Sample screen from the IQ-test. Participants have to find the correct symbol.

Task 2: *[This task is shown only to participants in the MIN treatments]* In the following, you will observe six screens in succession. On every screen,

you will observe two paintings next to each other. One of the two paintings (you do not know which one) is always from Wassily Kandinsky and the other one is from Paul Klee. Your task is to indicate on each screen, which of the two paintings you like better.

Based on your decisions in task 2, you will be assigned a type.

- If you prefer the pictures by Kandinsky, the type KANDINSKY is assigned to you.
- If you prefer the pictures by Klee, the type KLEE is assigned to you.

At the end of the first part, you will get to know whether you have been assigned type KANDINSKY or KLEE.

If you still have any questions, please raise your hand and wait quietly until one of the experimenters attends to you.

[The following feedback is provided to subjects at the end of the performance stage:]

Your score of correctly answered questions: Number♯

In this experiment, the participants are split into two groups of equal size based on their scores of correctly answered questions.

- If you belong to the group of participants who correctly answered many questions relative to all participants you will be assigned type HIGH.
- If you belong to the group of the participants who correctly answered few questions relative to all participants you will be assigned type LOW.

Based on your relative performance in the task, you are assigned the following type: [LOW or HIGH]

Instructions — part two

You are now in the second part of the experiment. In this part, you and two other participants will form a group of three subjects. We call the participants in your group participants 1,2, and 3. Your role, regardsless whether you are participant 1, 2, or 3, is already determined and remains the same during the whole experiment. You will learn later in the experiment which role you are in.

Decision of participant 2

In this part of the experiment, only participant 2 will take a decision; participants 1 and 3 do not take decisions.

Consequences of the decision of participant 2

Participant 2 decides between two options. This decision has an impact on all participants in the group. The following table C.2 shows the payment of participants 1, 2, and 3, depending on the decision of participant 2. If participant 2 decides on choosing LEFT (see left column), then all participants

in the group receive 20 points. If participant 2 decides on RIGHT (see right column), then he or she receives 26 points, participant 1 receives 16 points, and participant 3 receives 26 points.

Table C.2: **Payoff of participants depending on the decision of participant 2**

	Participant 2 chooses left	Participant 2 chooses right
Participant 1	20	16
Participant 2	20	26
Participant 3	20	26

You will now see a decision screen on which participant 2 has to decide between LEFT and RIGHT. *[Between conditions A and B, the payoffs of participant 1 and 3 were swopped.]*

[Subjects are informed about their type (Kandinsky or Klee in minimal groups, and LOW or HIGH in performance-based groups)]

[Before they go to the decision screen, the two subjects who share the same type within the group are instructed on the screen about the decision mode:]

So far, you do not know whether you are in the role of participant 1 or 2. You will be informed about your actual role (participant 1 or participant 2) at the end of the experiment after you have reached a decision. To determine the payoffs, only the decision of the role of participant 2 is relevant. If you

are in the role of participant 1, your decision does not affect the payoffs in the experiment.

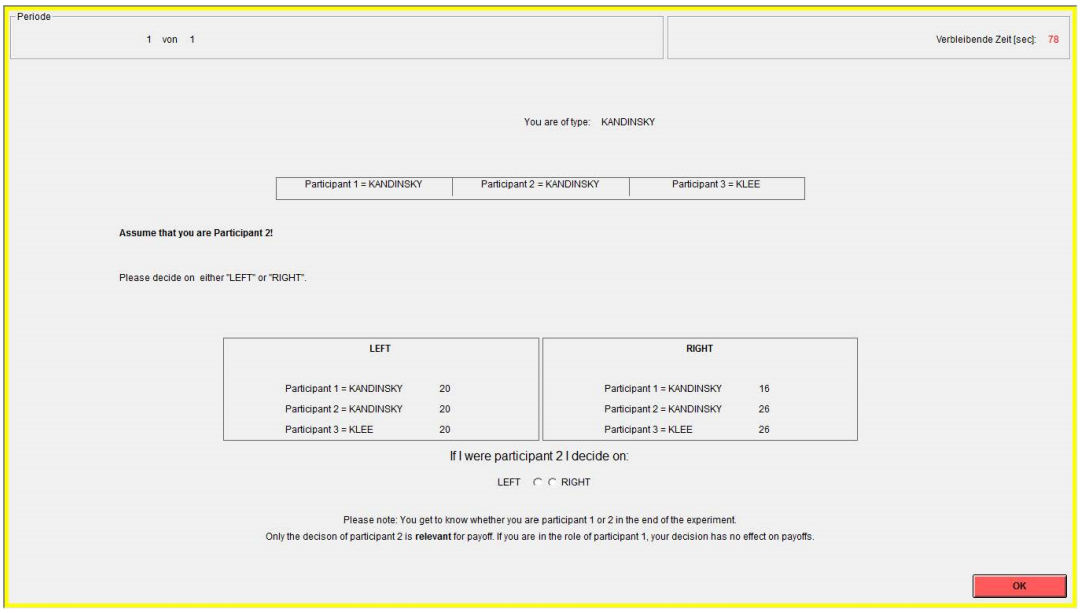


Figure C.2: Decision Screen.
Note: Sample screen from MIN treatment.

Instructions — part three

Your payment of the second part is already determined and you will be informed about that payoff at the end of the experiment. Now, you receive the **instructions of the third part of the experiment:**

You are now in the third part of the experiment. This part is identical to the second part of the experiment, with the only difference being that now,

participant 1 also takes a decision. In this part you are in the same group and in the same role as in the second part.

Decision of participant 2: The decision of participant 2 is identical to the decision in the second part of this experiment.

Decision of participant 1: Participant 1 has the opportunity to send "deduction points" to participant 2. Sending a deduction point is costly for participant 1 and receiving a deduction point is also costly for participant 2:

- For every deduction point that participant 1 sends to participant 2, participant 1 loses 1 point;
- For every deduction point that participant 2 receives from participant 1, participant 2 loses 3 points.

Participant 1 can send 4 deduction points at most.

- Example 1: Assume that participant 1 sends 3 deduction points. In this case, the payoff of participant 1 decreases by 3 points and the payoff of participant 2 decreases by 9 points (3 x 3 deduction points).
- Example 2: Assume that participant 1 sends no deduction point. In this case the payments of participants 1 and 2 remain unchanged.

In the following, you will observe a decision screen on which those in the role of participant 2 decide between LEFT and RIGHT. After that, another screen appears on which those in the role of participant 1 decide how

many deduction points they want to send to those in the role of participant 2.

[Depending on the treatments, subjects have the label [Kandinsky or Klee in MIN and LOW or HIGH in treatments LOW and HIGH] and are assigned into treatment specific groups.]

After the third part, the experiment is over and you receive your payment in cash. If you have any questions, raise your hand and wait quietly until one of the experimenters attends to you.

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